Interdisciplinary Doctoral Program

Departmental Procedures and Requirements

Department of Electrical and Computer Engineering

The University of Akron

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Starting Out

The Department Chair assigns a temporary faculty advisor to an incoming student until a permanent advisor is named and an Interdisciplinary Doctoral Committee (IDC) is formed. In order to obtain appropriate advice and make informed decisions from the outset of the doctoral studies, the incoming student should make an effort to become acquainted with the faculty and the available coursework in the student’s area of interest.

Graduate students with backgrounds in disciplines other than engineering should have completed undergraduate coursework in calculus and differential equations, and one year of classical physics. They may be required to take extra undergraduate coursework (bridge-up courses) to remediate deficiencies in their backgrounds. The required bridge-up courses will be determined by the Graduate Policy Committee on an individual basis.

Doctoral Degree Requirements Summary

The student must complete the following academic requirements for the Doctoral Degree:

- Pass a departmental Qualifying Examination. The purpose of the qualifying examination is to determine admissibility to the doctoral program.
- Identify an interdisciplinary field of study, a dissertation director, and an Interdisciplinary Doctoral Committee (IDC) before completion of 18 credits of course work. The dissertation director and the IDC cannot be officially appointed before the Qualifying Examination is passed.
- Complete a formal Plan of Study that is officially approved by the IDC. The Plan of Study is a list of at least 48 credits of graduate coursework beyond the bachelor’s degree, according to the credit requirements specified below. The Plan of Study should be filed in the first year of doctoral study.
- Satisfy the residency requirement for full-time study.
- Satisfy the foreign language requirement (or its substitute, as specified below) approved by the IDC.
- Pass a Candidacy Examination and present a Dissertation Proposal. The Candidacy Examination tests the student’s ability to conduct independent research, and the Dissertation Proposal describes the plan for completing the doctoral research.
- Present and successfully defend the dissertation before the IDC.

In addition to the departmental requirements, the student must satisfy the College of Engineering requirements specified in the Interdisciplinary Doctoral Procedures and the University requirements specified in the Graduate Bulletin.

Qualifying Examination

The objective of the Qualifying Examination is to determine if the student has sufficient engineering background to undertake the doctoral studies; therefore, it is the first required step in
the Ph.D. program. The Qualifying Examination is offered each Fall and Spring semester. It is ordinarily taken in the first semester of doctoral study, although a time extension may be granted.

The student must pass the Qualifying Examination in at most two attempts. A student who fails the first attempt will be allowed to take the exam again the next semester. Students who fail the exam twice will be dismissed from the Ph.D. program.

The detailed requirements for the ECE Qualifying Examination are set forth in the departmental document *Ph.D. Qualifying Examination Procedures and Regulations*.

**Dissertation Director**

After passing the Qualifying Examination, the student selects a Dissertation Director. The student should select a Dissertation Director during the first year of doctoral study. The Dissertation Director must be a full-time faculty member in the College of Engineering and must hold the Graduate Faculty status that permits the direction of doctoral dissertations.

**Interdisciplinary Doctoral Committee (IDC)**

After the student chooses the Dissertation Director, an Interdisciplinary Doctoral Committee (IDC) is formed. The student should form an IDC during the first year of doctoral study. The IDC has authority over the individualized study and the academic standards for the doctoral student.

The IDC must consist of at least five full-time faculty members, with at least three from within the College of Engineering and at least one from outside the College of Engineering. The outside member of the committee is usually someone with expertise in a field related to the dissertation research. The outside member functions as a regular member of the committee, attending all meetings and receiving preliminary drafts or chapters as do other committee members. Of the three IDC members from the College of Engineering, one must be from a department different from that of the Dissertation Director.

If there are any changes to the IDC membership after initial approval by the Graduate School, the Dissertation Director shall send a list of the revised committee membership to the Graduate School for approval and see that the affected faculty are informed. A request for a change in the IDC membership should include the reason for the change.

The doctoral student may change the membership of the IDC or the Dissertation Director at any time before the Plan of Study is submitted to the IDC. After that, the doctoral student must petition the Dean of the College of Engineering to alter the membership of the IDC or to change the Dissertation Director.

**Plan of Study**

The doctoral student and the Dissertation Director formulate the student’s plan of study, which consists of the list of graduate courses to be completed. The IDC meets with the doctoral student to consider the Plan of Study and to discuss the research topic to be pursued; this is
usually the first official meeting of the IDC. The doctoral student should have a Plan of Study approved by the IDC in the first year of doctoral study.

The courses listed in the Plan of Study constitute the individualized curriculum that the doctoral student must complete to meet the course requirements for the doctoral degree. Since the Plan of Study is individualized, it may contain more credits than the minimum specified in the doctoral degree requirements. The IDC need not accept any courses taken prior to the appointment of the Dissertation Director and the formation of the IDC.

The Plan of Study must conform to the following Ph.D. degree credit requirements:

- The minimum total credit-hour requirement for the doctoral program is 96 credit hours, including at least 48 credits of graduate-level coursework and at least 48 credits of Ph.D. research and dissertation work.
- At least 24 credits of graduate-level coursework must be taken at The University of Akron. At most 24 credits of coursework may be transferred in from previous graduate work, such as a master’s degree, at another institution.
- At least 36 credits of coursework must be at the 600 or 700 level. At least 18 of these credits must be taken at The University of Akron.
- No more than 6 credits are allowed to be Special Topics or Special Problems courses.
- No more than 3 credits are allowed to be independent study, as opposed to regular lecture courses.

Full-time students on assistantships are required to register for 15 credits of combined coursework and research per semester.

Credits for research and dissertation work are assigned as “In Progress” (IP) until all the degree requirements are completed. Then, they are assigned grades of “Credit” (CR) or No Credit” (NCR) by the Dissertation Director.

Residency Requirement

Every doctoral student must complete at least two consecutive semesters of full-time study and involvement in departmental activities at The University of Akron.

Language Requirement

To determine the student’s ability for self-instruction, the IDC may require the student to demonstrate proficiency in a foreign language. The following three language options are approved by the University:

- Plan A: Reading knowledge, with the aid of a dictionary, of two approved foreign languages.
- Plan B: Comprehensive knowledge of one approved foreign language, including reading without the aid of a dictionary.
• Plan C: The demonstration of competence in appropriate technical research skills. This is the plan usually followed in the College of Engineering. Competency in computer programming is the technical skill usually cited as the substitute for a foreign language.

Candidacy Examination and Dissertation Proposal

The Candidacy Examination and the Dissertation Proposal together constitute a single test of the doctoral student’s ability to conduct and report the results of independent research in his or her chosen field. The Candidacy Examination takes the form of a literature review in the field of research, and a report of the preliminary research already completed by the doctoral student. The Dissertation Proposal constitutes a plan for completing the doctoral research, including at least a description of the proposed methodology and the expected results. The Candidacy Examination and the Dissertation Proposal are combined into a single document, which forms the basis of the first chapters of the doctoral Dissertation. The document should follow the format specified in the latest edition of the Graduate School’s manual, Guidelines for Preparing a Thesis or Dissertation.

The doctoral candidate distributes copies of the Candidacy Examination and Dissertation Proposal document to all members of the IDC at least two weeks prior to the Candidacy Examination.

The doctoral student presents the Candidacy Examination and the Dissertation Proposal before the IDC; this is usually the second official meeting of the IDC. The IDC examines the doctoral student and provides written comments and recommendations concerning the technical aspects of the preliminary research and its proposed completion. These comments and recommendations generally also address the issues of the organization, style, neatness, grammar, and clarity of the presentation. The Dissertation Proposal and the written recommendations of the IDC become a part of the student’s file in the College of Engineering; these provide a formal record of the interaction between the doctoral student and the IDC concerning the proposed research.

After the doctoral student passes the Candidacy Examination, he or she becomes a doctoral candidate and may submit the Advancement to Candidacy form to the Graduate School. The Advancement to Candidacy form must be submitted no later than May 15 for the January commencement, and no later than September 15 for the May commencement. These forms are available from the Graduate School or in the ECE office.

If the doctoral student fails the Candidacy Examination, then one re-examination is permitted within a period specified by the IDC. If the student fails the re-examination, then the student will be dismissed from the doctoral program in engineering.

Dissertation and Oral Defense

The Doctoral Dissertation must represent a significant contribution to knowledge, demonstrating the doctoral candidate’s competence in independent research and scholarly exposition.
The doctoral candidate distributes draft copies of the Dissertation to each member of the IDC at least two weeks prior to the Dissertation Defense.

The IDC administers the Dissertation Defense. This is usually the third and final official meeting of the IDC. This examination is open to the graduate faculty. At the opening of the Dissertation Defense, the doctoral candidate makes an oral presentation of the dissertation. Students and any other guests are allowed to attend this presentation, and then dismissed for the rest of the exam. The IDC examines the candidate and offers recommendations and corrections to ensure that the research meets the scholarly standards appropriate for the doctoral degree.

At the end of the examination, the IDC votes on the Dissertation Defense (pass or fail). For the candidate to pass the Dissertation Defense, the “pass” vote must be unanimous. Each committee member casts a positive or negative vote by affixing his or her signature to a single form. The form is sent to the Graduate School indicating that the defense has been held, and that the candidate has passed or failed. This form must be on file in the Graduate School at the time the dissertation is officially submitted.

The doctoral candidate incorporates the recommendations and corrections of the IDC into the Dissertation and prepares the final draft. The format of the Dissertation must conform to accepted professional standards and to the specifications of the Graduate School’s manual, Guidelines for Preparing a Thesis or Dissertation.

Finishing Up

The Dissertation is signed by the Dissertation Director, the members of the IDC, the ECE Department Chair, the Dean of Engineering, and the Dean of the Graduate School. The candidate submits the approved and signed Dissertation to the Graduate School. Two copies of the dissertation are due in the Graduate School at least two weeks prior to commencement.

Five copies of the completed and signed Dissertation are required – two for the Graduate School, one for the department, one for the Dissertation Director, and one for the doctoral candidate. An additional copy is required if the candidate has a co-advisor. The candidate submits the required copies to the Dean of the College of Engineering for approval. A copy of the abstract is placed in the candidate’s file and then the copies of the Dissertation are returned to the candidate, who delivers them to the Graduate School.

The candidate shall provide to the Graduate School an additional copy of the abstract to be sent to a centralized Dissertation Abstracts database. The candidate should obtain from the Graduate School the necessary information on the required form and length of the abstract, as well as the agreement form required to submit an abstract to the database.